TRICHOPTERA OF HEADWATER STREAMS IN THE FERNOW EXPERIMENTAL FOREST, MONONGAHELA NATIONAL FOREST, WEST VIRGINIA[1]

Michael B. Griffith, Sue A. Perry[2]

ABSTRACT: In support of several ongoing studies on the ecology of streams in the Fernow Experimental Forest, West Virginia, adult Trichoptera were identified from emergence and light trap samples taken from six experimental catchments. Thirty-seven species from 24 genera and 13 families were collected, including four species that were previously unrecorded from West Virginia.

Our research at the Fernow Experimental Forest, West Virginia, on the effects of acid precipitation and on the nontarget effects of the application of the forest pesticide diflubenzuron, has included work on the macroinvertebrate communities of second order streams draining several headwater catchments (Griffith and Perry, 1991). Only two previous studies have produced species lists for streams in the Fernow Experimental Forest. Harris (1973) collected benthic samples from the streams and weir ponds in Watersheds 1, 3, 4, 6, and 7, and Case (1983) collected kick samples of aquatic nymphs from Watersheds 1, 4, and 6. Both studies identified the insects primarily to genus.

Tarter (1990) provided a checklist for the Trichoptera of West Virginia. This checklist includes 176 species from 60 genera and 15 families.

To facilitate ongoing and future research at the Fernow Experimental Forest, we conducted a survey of aquatic insects in the streams draining the catchments used in our studies. We present a species list of the Trichoptera collected in this survey.

STUDY SITES

The Fernow Experimental Forest is a U.S. Forest Service research preserve located 5 km south of Parsons in Tucker County, West Virginia,

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[2]U.S. Fish and Wildlife Service, West Virginia Cooperative Fish and Wildlife Research Unit[3], Division of Forestry, West Virginia University, Morgantown, WV 26506-6125.

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in the northern part of Monongahela National Forest (39°3′N, 79°40′W; Figure 1). Established in 1951, the 1474-ha experimental forest includes the entire catchment of Elklick Run, a fourth order tributary of the Black Fork of the Cheat River. The experimental forest includes nine gauged experimental catchments and several ungauged catchments., We conducted surveys on six second order streams draining catchments designated as Watershed 1 (WS1), Watershed 3 (WS3), Watershed 4 (WS4), Watershed 7 (WS7), Watershed 13 (WS13), and North Fork of Hickman Slide Run (HSR). WS3, WS4, and HSR are reference catchments that have undergone little disturbance since about 1910, whereas WS1, WS3, and WS7 are experimental catchments that were last logged in 1958, 1969, and 1969, respectively. WS1, WS3, WS4, WS7, and WS13 are underlain by shales and siltstones of the Hampshire formation, whereas HSR is underlain by limestones and shales of the Greenbriar and Mauch Chunk formations. Because of the presence of limestone in the catchment, HSR is characterized by higher pH and alkalinity than the other streams. A more detailed description of the study sites may be found in the works of Griffith and Perry (1991, 1992).

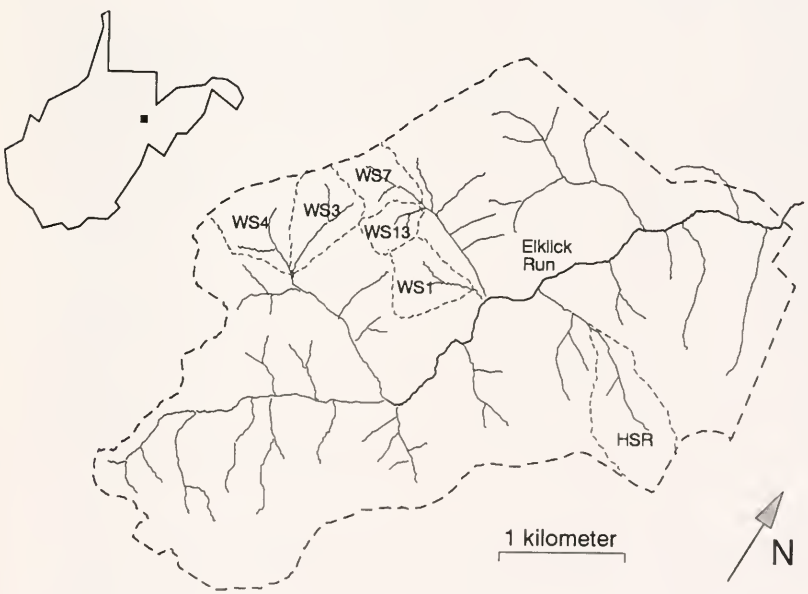

Figure 1. Fernow Experimental Forest with locations of the study catchments.

MATERIALS AND METHODS

The surveys were conducted from June 1989 through August 1991 using primarily emergence traps modified from the WEEK design of LeSage and Harrison (1979). These collections were supplemented by periodic light trapping with blacklight traps and collections by hand when adults were observed during other sampling. A more detailed description of sampling may be found in Griffith and Perry (1992).

All collected material was preserved in 85% ethanol. Voucher specimens have been placed in the collection of the West Virginia Cooperative Fish and Wildlife Research Unit in the Division of Forestry at West Virginia University.

RESULTS AND DISCUSSION

We collected 37 species from 24 genera and 13 families of Trichoptera (Table 1). The most diverse families were the Rhyacophilidae, with seven species all from the genus, *Rhyacophila*, and the Hydropsychidae with six species from four genera. We collected four species which were previously unreported for the state of West Virginia.

In general, the species list is characteristic of the small lotic habitats in the Fernow Experimental Forest, but some species seem to be from other larval habitats. Examples include the limnephilid, *Nemotaulius hostilis* (Hagen), the larvae of which have been reported by Stout and Stout (1989) from small remnant boreal wetlands in West Virginia. When the methods by which different species were collected were examined, the obvious conclusion was that we probably collected some species from outside these headwater streams with the light traps. Although the combination of survey methods we used worked well for Plecoptera (Griffith and Perry 1992), Trichoptera tend to be stronger fliers and may be attracted to lights far from their larval habitats (Waringer 1991). Other species that were only collected using light trapping and probably came from other larval habitats included *Ptilostomis ocellifera* (Walker), *Hydropsyche sparna* Ross, and *Rhyacophila fuscula* (Walker). *Ptilostomis ocellifera* larvae also occur in lentic habitats whereas *H. sparna* (M. Griffith, pers. obs.) and *R. fuscula* (Sykora and Weaver 1979) tend to occur in larger streams. Most other species that we collected seem to match well with generic identifications from our benthic samples and are characteristic of the fauna of headwater Appalachian streams. This observation is particularly true for the four species and one genus that are new state records, which seems to suggest that these small stream habitats have been undercollected in West Virginia.

Two species, *Adicrophleps hitchcocki* Flint and *Palaegepetus celsus* (Ross), have been reported to occur in association with aquatic mosses and liverworts in Appalachian streams (Wiggins 1977) and to use these plants for case-building materials. The co-occurrence of these two species in streams in the Fernow appears to be unusual, but these streams support a diverse assemblage of aquatic mosses and liverworts (S. Stevenson, Fairmont State University, unpubl. data).

In a survey of Plecoptera in these streams, several species appeared to exhibit distributions among streams that were related to water chemistry or catchment management history (Griffith and Perry, 1992). No species of Trichoptera were limited to the more alkaline stream, HSR, but one species, *Homoplectra monticola* (Flint), was only collected from WS4 and WS13, the two reference catchments.

TABLE 1. Checklist of Trichoptera collected from headwater catchments in the Fernow Experimental Forest, Tucker County, West Virginia. (E—collected in emergence traps, L—collected in light traps only, X—collected in larval collection only)

Stream	HSR	WS1	WS3	WS4	WS7	WS13
Order Trichoptera						
Family Philopotamidae						
Subfamily Philopotaminae						
Dolophilodes distinctus (Walker)	E	E	E	E	E	E
Wormaldia moesta (Banks)	E	E	E	E	E	
Family Psychomyiidae						
Subfamily Psychomyiinae						
Lype diversa (Banks)	E	E	E	E		E
Family Polycentropodidae						
Subfamily Polycentropodinae						
Polycentropus cinereus Hagen	E		E	E	E	
P. maculatus Banks	E	E	E	E	L	E
Subfamily Dipseudopsinae						
Phylocentropus lucidus (Hagen)	L			E		
Family Hydropsychidae						
Subfamily Arctopsychinae						
Parapsyche apicalis (Banks)			E	E	E	E
Subfamily Diplectroninae						
Diplectrona modesta Banks	E	E	E	E	E	E
Homoplectra monticola (Flint)				E		E

Stream	HSR	WS1	WS3	WS4	WS7	WS13
Subfamily Hydropsychinae						
Hydropsyche morosa Hagen			E			
H. sparna Ross	L	L	L	L	L	L
H. ventura Ross	E		L	L		
Family Rhyacophilidae						
Subfamily Rhyacophilinae						
Rhyacophila banksi Ross	E	E		E		E
R. carolina Banks	L	E	E	L	E	E
R. carpenteri Milne	L	E		L		
R. fuscula (Walker)	L			L		
R. glaberrima Ulmer			E	L	E	E
R. nigrita Banks	E		E	E		E
R. vibox Milne	E		E	L		
Family Glossosomatidae						
Subfamily Glossosomatinae						
Glossosoma nigrior Banks	E		E			
Family Hydroptilidae						
Subfamily Ptilocolepinae						
Palaeagapetus celsus (Ross)		L	L	E		
Subfamily Hydroptilinae						
Stactobiella delira (Ross)					L	
Family Phryganeidae						
Subfamily Phryganeinae						
Ptilostomis ocellifera (Walker)				L		
Family Brachycentridae						
Adicrophleps hitchcocki Flint*			X	X		E
Micrasema rusticum (Hagen)*		L				
Family Limnephilidae						
Subfamily Pseudostenophylacinae						
Pseudostenophylax uniformis (Betten)	L			L		E
Subfamily Limnephilinae						
Nemotaulius hostilis (Hagen)			L			
Pycnopsyche gentilis (McLachlan)	E	E	E	E	E	E
P. scabripennis (Rambur)	E	E	E			E
Subfamily Goerinae						
Goera stylata (Ross)*			L			

Stream	HSR	WS1	WS3	WS4	WS7	WS13
Family Uenoidae						
Subfamily Thremmatinae						
Neophylax aniqua Ross	E	E	E			
Neophylax wigginsi Sykora and Weaver		E	E		E	
Family Lepidostomatidae						
Lepidostoma griseum (Banks)	E	E		E		E
L. togatum (Hagen)				E		
L. vernale (Banks)				L		
Family Molannidae						
Molanna ulmerina Navas*			E	E		
Family Leptoceridae						
Subfamily Leptocerinae						
Oecetis cinerascens (Hagen)			E			

*New state records

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